

ABSTRACT

A system, methods, and computer program products are disclosed for creating virtual application templates for the purpose of propagating a single application snapshot into multiple, distinct images. Snapshot virtual templates allow multiple application instances to use the same fixed resource identifier by making the resource identifier virtual, privatizing it, and dynamically mapping it to a unique system resource identifier. When a snapshot is cloned from a virtual template, the common or shared data is used exactly as is, whereas the non-sharable data is either copied-on-write, multiplexed, virtualized, or customized-on-duplication. The present invention notes access to modified resources, fixed system IDs/keys and unique process-related identifies and automatically inserts a level of abstraction between these resources and the application. The resources contained in a snapshot virtual template can be dynamically redirected at restore time. Access to memory and storage is managed in a copy-on-write fashion. System resource handles are managed in a virtualize-on-allocate fashion or by a multiplex-on-access mechanism. Process-unique resources are managed in a redirect-on-duplicate fashion. Rules may be defined through an application configurator that allows some degree of control over the creation of non-sharable data. The snapshot virtual template is constructed by dividing the snapshot image into sharable and non-sharable data. Knowledge of which system resources can be shared is encoded in the application snapshot/restore framework.